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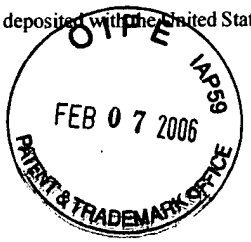

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Michael S. Huppert
name of person signing certification

Michael Huppert
Signature

2/3/06
Date

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of	:	**Confirmation No. 1301**
Inge JOHANSEN et al.	:	Docket No. 2001_1827A
Serial No.10/009,690	:	Group Art Unit 1725
Filed March 12, 2002	:	Examiner Kevin P. Kerns

ARRANGEMENT FOR EQUIPMENT RELATED TO HORIZONTAL CONTINUOUS CASTING OF METAL

Mail Stop: Appeal Briefs - Patents

REQUEST FOR REINSTATEMENT OF THE APPEAL
And "SUPPLEMENTAL" APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the appeal brief filed August 8, 2005, the Examiner withdrew the previous rejections and entered new grounds of rejection. In accordance with 37 CFR 1.193(b)(2), Appellant elects to request reinstatement of the appeal.

This request is accompanied by a supplemental appeal brief incompliance with 37 CFR 1.192(c). Applicable portion of the previous appeal brief have been incorporated into the supplemental appeal brief.

The following is a supplemental appeal brief in compliance with the requirement of 37 CFR 1.192(c). Pursuant to the provisions of 37 CFR § 41.20, a fee of $500.00 was submitted on August 8, 2005.

REAL PARTY IN INTEREST

The real party in interest is NORSK HYDRO ASA, the assignee of record (Reel/Frame: 012669/0222).

RELATED APPEALS AND INTERFERENCES

There are no related appeals and interferences.

STATUS OF CLAIMS

Claims 1-8, 10 and 15 are cancelled.

Claims 9, 11-14 and 16-18 are rejected.

The rejections of claims 9, 11-14 and 16-18 are being appealed. A complete copy of all the pending claims is provided in the attached Claims Appendix. Also, claim 17 was objected to based on a typographical error which does not appear in the attached Claims Appendix.

STATUS OF AMENDMENTS

An amendment was filed on June 13, 2005, which is subsequent to the final rejection of November 9, 2004. An advisory action was mailed on June 21, 2005 and indicated that the proposed amendments will be entered for purposes of appeal. The claims in the attached Claims Appendix include the amendment submitted on June 13, 2005.

SUMMARY OF CLAIMED SUBJECT MATTER

A description of the subject matter of the rejected claims is presented below. All references to the specification refer to the substitute specification filed on February 17, 2004.

The subject matter of independent claim 9 is directed to horizontal continuous casting equipment for casting of metal. As shown in Fig. 1, the equipment includes an insulated reservoir (2) for containing liquid metal, and a mold (3) removably connected to the reservoir and defining a mold cavity (17).

As shown in Fig. 2(a), the mold includes a mold housing (8, 9) having a plurality of channels (10, 11) for delivering oil and gas to the mold cavity. A primary cooling section includes a circumferential wall formed of permeable wall material (12, 13) and is provided along the interior wall of the mold housing. The permeable wall material defines a wall of the mold cavity such that oil and/or gas can be supplied from the channels through the permeable wall material to the mold cavity.

A secondary cooling section, including at least one annular slit (16), is arranged along a circumference of the cavity for directly supplying coolant into the cavity so as to provide secondary cooling of the metal being cast. An insulating plate (19) is located at the inlet of the cavity, and is provided with through holes communicating the reservoir with the mold cavity. The insulating plate has a protrusion (24) extending in an axial direction of the mold along the wall of the cavity. The length of the protrusion is selected based on the required primary cooling effect.

Note that the insulating annular plate is exchangeable with another insulating annular plate having a different thickness, as defined in claim 13.

The subject matter of independent claim 14 is directed to horizontal continuous casting equipment for casting metal. The equipment includes an insulated reservoir (2) for containing liquid metal, and a mold removably connected to the reservoir and defining a mold cavity. The mold comprises a mold housing (8, 9) having a plurality of channels (10, 11). Permeable wall material (12, 13) is provided along an interior wall of the mold housing so as to define a wall of the mold cavity, and a plurality of nozzles (16; page 7, lines7-9) are arranged along a circumference of the cavity for directly supplying coolant into the cavity. An insulating plate (19) is provided with through holes (25, 26) that communicate the reservoir with the mold cavity. The insulating plate is provided with a protrusion that extends along said permeable wall material in an axial direction of the mold such that a cooling effect is affected by the length of the protrusion (see page 2, lines 15-17; page 5, lines 4-9; page 7, lines 11-13).

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Claims 9, 11-14 and 16-18 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,205,344 issued to Nagai et al. (hereinafter the "Nagai patent") in view of U.S. Patent No. 5,915,455 issued to Kittilsen et al. (hereinafter the "Kittilsen patent").

Claims 9, 11, 12, 14, 16 and 17 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 11, 17 and 25-30 of copending Application No. 10/018,174 in view of the Nagai patent.

ARGUMENT

The present invention is directed to horizontal casting equipment in which gas and oil can be supplied to a horizontal metal mold in a controlled manner in a primary cooling section of the mold. In the present invention, the cooling effect of the primary cooling section can be varied depending upon the length of a protrusion of the insulating plate (19). The primary issue in this appeal is whether the applied prior art references (i.e., the Nagai patent and the Kittilsen patent) disclose or suggest an insulating plate having an axially extending protrusion.

Independent claim 9 requires, *inter alia*:

a primary cooling section including a circumferential wall formed of permeable wall material, provided along an interior wall of said mold housing, so as to define a wall of the mold cavity, wherein oil and/or gas can be supplied through said permeable wall material to the mold cavity;

a secondary cooling section including at least one annular slit arranged along a circumference of the cavity for directly supplying coolant into the cavity so as to provide secondary cooling of the metal being cast; and

an insulating plate provided with through holes communicating said reservoir with the mold cavity, said insulating plate having a protrusion extending along the wall of the cavity in an axial direction of the mold, and the length of the protrusion is selected based on the required primary cooling effect. (Emphasis Added)

Independent claim 14 requires an insulating plate provided with through holes communicating said reservoir with the mold cavity, wherein said insulating plate is provided with a protrusion that extends along said permeable wall material in an axial direction of the mold such that a cooling effect is affected by the length of the protrusion. (Emphasis added)

* * * * *

Rejection of claims 9, 11-14 and 16-18 as being unpatentable over the Nagai patent in view of the Kittilsen patent

The present invention is directed to a horizontal direct chill casting apparatus in which the inventive feature is an exchangeable plate that enables the selection of a cooling effect based on the particular alloy to be cast. One of ordinary skill in the art would recognize that different aluminum alloys require different primary cooling to obtain a high aluminum billet quality. The applied references lack any recognition of the importance of the relationship between the primary cooling and the quality of the cast billet depending on the chemical composition of the aluminum alloy. Clearly, none of the references remotely suggest that the primary cooling of a direct chill mold can be differentiated (changed) by replacing the insulating plate provided with a particular protrusion.

Nagai discloses a horizontal casting device having a mold 3 and an orifice plate 2 formed with a plurality of orifices 4. As shown in Fig. 3, the orifice plate is formed with a number of radial grooves 6. An annular lubricating oil passage 5 is formed in the mold 3 on a facing surface between the orifice plate 2 and the mold 3. An annular gap 7 extends horizontally between an outer circumferential surface of the orifice plate 2 and an inner circumferential surface of the mold 3. The annular gap 7 is communicated with the radial grooves 6. As shown in Fig. 4, the orifice plate is formed on its front surface with a recess, and a starting pin 12 is located in the recess. A cooling water passage 8 is formed in the mold 3 to inject cooling water and cool a cast ingot 9.

The object of the Nagai patent is to eliminate surface defects of the cast ingot. The object is achieved by the particular structure (i.e., radial grooves 6, and gap 7) that causes the lubricating oil to be uniformly fed to an outer surface of the cast ingot (col. 2, lines 3-43). In particular, when the oil flow from the radial grooves 6 reaches the outer circumferential surface of the orifice plate, the flow direction of the oil is changed to a direction that is parallel to the drawing direction of the cast ingot. The oil then uniformly expands over the gap between the inner circumferential surface of the mold and the outer circumferential surface of the orifice plate. "Accordingly, the outer surface of the cast ingot can be substantially uniformly lubricated, and a surface defect of the cast ingot is therefore hard to generate" (col. 2, lines 30-33).

Kittilsen discloses a horizontal casting apparatus including a mold 10 having primary and secondary cooling water circuits (11, 12) and a channel 20 for supplying oil to lubricate the mold. A transition ring 21, formed of insulating porous refractory material, is positioned between the insulating plate 29 and the mold 10 (see Fig. 2).

However, the cooling circuits of Kittilsen do not correspond to the primary and secondary cooling sections required in claim 9 or the primary and secondary cooling effects required in claim 14. Furthermore, the insulating plate 29 of Kittilsen does not include the claimed projection extending along a wall of the mold ("permeable wall material" in claim 14) in an axial direction of the mold such that a cooling effect is affected by the length of the protrusion.

In Kittilsen, heating elements 27 are provided along the inlet to prevent the steel pipe 28 from extracting heat from the molten metal. Also, even assuming, arguendo, that the steel pipe could be considered a projection of the insulating wall, the steel pipe does not extend along a wall of the mold 10.

Although the Examiner spends a considerable amount of time discussing the Kittilsen patent, the reason for applying Kittilsen is the disclosure of the transition ring 21, which is formed of insulating porous refractory material. The Examiner combines the Nagai patent and the Kittilsen patent and concludes that:

"It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the horizontal continuous casting device disclosed by Nagai et al., by adding the permeable wall material along the interior wall of the mold housing, as taught by Kittilsen et al., in order to produce ingots at adequate casting speed with good surface quality (Kittilsen et al.; abstract; column 1; lines 55-62; column 2, lines 1-34; column 3, lines 18-67; column 4, lines 1-27; and column 5, lines 20-41)."

Thus, the Examiner is of the opinion that providing Nagai with the refractory transition ring would produce ingots at adequate casting speed with good surface quality. However, the text cited by the Examiner does not support the stated motivation. In the Kittilsen patent, mold depth L1 and total mold depth L2 are the primary factors that affect casting speed (see col. 3, lines 50-59). The transition ring is employed to supply the protective gas.

Further, it is not clear how the Kittilsen transition ring would be employed in the environment of Nagai. Apparently the Examiner is proposing a complete reconstruction of the Nagai mold to include a transition ring for supplying gas to the mold cavity. Such a modification would not provide permeable wall material along the interior wall of the mold housing. In any event, the modification proposed by the Examiner would destroy the intended purpose of the Nagai patent, i.e., providing a lubricating oil flow arrangement that causes the oil to flow in a uniform manner in a direction that is parallel to the drawing direction of the cast ingot. If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Accordingly, it is submitted that the Examiner has not made out a proper prima facie case of obviousness in rejecting at least claims 9 and 14 under 35 U.S.C. § 103(a).

Further, on page 6 of the explanation of the Kittilsen patent, the Examiner states that:

"One of ordinary skill in the art would have recognized that (in addition to the conventional types of mold material --e.g. aluminum, copper, steel etc.), although the primary cooling is not specifically controlled by valve means, the removal and/or exchanges of several molds having various geometries (having dimensions with axial protrusions, leading to variance in the coolant flow rates through the annular slits/nozzles) were made (easily replaceable) by Kittilsen et al. (in Tables I and II), for the purpose of producing ingots at adequate casting speed with good surface quality (Kittilsen et al.; abstract; column 1, lines 55-67; column 2, lines 1-54; column 3, lines 7-67; column 4, lines 1-27; column 5, lines 20-41; and Figures and 2)." (emphasis added)

Initially, it is noted that Tables I and II, which are referenced by the Examiner, show molds that were tested to determine an optimal solution. The different parameters referred to by the Examiner are mold size, mold depth, and total mold depth. The tables have absolutely nothing to do with an insulating plate having an axial extending protrusion. Thus, the Examiner's suggestion to the contrary is incorrect.

The fact is, the Kittilsen patent does not use an insulating plate with an axial protrusion, but a steel pipe 28 extending (protruding) inwardly into the mold and the pipe has no insulating effect. In fact the steel pipe would have the opposite effect, namely transmitting more heat to the mold.

Furthermore, the steel pipe of the Kittilsen patent has nothing to do with the primary cooling effect, which is provided by the primary cooling water circuit 11 (col. 3, lines 8-10).

Clearly, in the present case there is nothing of record, absent the Appellants' specification, that would suggest the desirability of modifying the horizontal casting apparatus of the Nagai patent to include a primary cooling section including a circumferential wall formed of permeable wall material provided along an interior wall of the mold housing.

To establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant. See In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998).

Therefore, since there is no motivation to combine the Nagai and Kittilsen patents, it is submitted that the rejection of claims 9, 11-14, and 16-18 cannot be sustained.

Provisional Rejection of claims 9, 11, 12, 14, 16 and 17 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 11, 17 and 23-30 of copending application No. 10/018,174 in view of the Nagai patent.

The provisional rejection does not meet each and every limitation of claim 9 or claim 14 because the claims of copending application No. 10/018,174 in combination with the teachings of the Nagai patent do not disclose or suggest an insulating plate having a projection that extends axially along an interior wall of the mold cavity such that a cooling effect is affected by the length of the protrusion. The recess in the orifice plate 2 of Nagai is provided for receiving a starting pin 12, and has nothing to do with the primary cooling of the cast ingot. Accordingly, the proposed combination does not meet the limitations of at least claims 9 and 14. Note that the functional limitations cannot be read out of the claims, Each word of the claims must be considered.

Note that the claimed feature is obvious only if the prior art references provide the teaching or suggestion to one of ordinary skill in the art to make the changes that would produce the claimed device. See Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 935, 15 USPQ2d 1321, 1324 (Fed. Cir.), *cert. denied*, 498 U.S. 920 (1990). Clearly the teachings of the Nagai patent do not provide the necessary motivation or suggestion to provide the novel features set forth in each of independent claims 9 and 14.

Conclusion

For the reasons set forth above, it is submitted that the Nagai/Kittilsen combination, is not a proper basis for a rejection of at least independent claims 9 and 14. Therefore, the Examiner's decision to finally reject claims 9, 11-14, and 16-18 should be reversed.

Respectfully submitted,

Inge Johansen et al.

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CLAIMS APPENDIX

9. Horizontal continuous casting equipment for casting of metal, said equipment comprising an insulated reservoir for containing liquid metal, and a mold removably connected to said reservoir and defining a mold cavity, said mold comprising:

a mold housing having a plurality of channels for delivering oil and gas to the mold cavity;

a primary cooling section including a circumferential wall formed of permeable wall material, provided along an interior wall of said mold housing, so as to define a wall of the mold cavity, wherein oil and/or gas can be supplied through said permeable wall material to the mold cavity;

a secondary cooling section including at least one annular slit arranged along a circumference of the cavity for directly supplying coolant into the cavity so as to provide secondary cooling of the metal being cast; and

an insulating plate provided with through holes communicating said reservoir with the mold cavity, said insulating plate having a protrusion extending in an axial direction of the mold along the wall of the cavity, and the length of the protrusion is selected based on the required primary cooling effect.

11. The equipment as claimed in claim 9, wherein said mold housing is formed of steel.

12. The equipment as claimed in claim 9, wherein said mold housing comprises a first housing part surrounding said permeable wall material, a second housing part, and a thermally insulating annular plate arranged against the first housing part in order to reduce the thermal transfer between the mold cavity and an intermediate cooling channel that is defined by said first and second housing parts and said thermally insulating annular plate.

13. The equipment as claimed in claim 12, wherein said insulating annular plate is exchangeable with another insulating annular plate having a different thickness.

14. Horizontal continuous casting equipment for casting metal, said equipment comprising an insulated reservoir for containing liquid metal, and a mold removably connected to said reservoir and defining a mold cavity, said mold comprising:

a mold housing having a plurality of channels for delivering oil and gas to the mold cavity in order to permit the supply of oil and gas to be varied about the circumference of the mold cavity;

permeable wall material provided along an interior wall of said mold housing so as to define a wall of the mold cavity, wherein oil and/or gas can be supplied through said permeable wall material to the mold cavity, and heat transfer through the permeable wall material provides primary cooling to the metal being cast;

a plurality of nozzles arranged along a circumference of the cavity for directly supplying coolant into the cavity so as to provide secondary cooling of the metal being cast; and

an insulating plate provided with through holes communicating said reservoir with the mold cavity, wherein said insulating plate is provided with a protrusion that extends along said permeable wall material in an axial direction of the mold such that a cooling effect is affected by the length of the protrusion.

16. The equipment as claimed in claim 14, wherein said mold housing is formed of steel.

17. The equipment as claimed in claim 14, wherein said mold housing comprises a first housing part surrounding said permeable wall material, a second housing part, and a thermally insulating annular plate arranged against the first housing part in order to reduce the thermal transfer between the mold cavity and an intermediate cooling channel that is defined by said first and second housing parts and said thermally insulating annular plate.

18. The equipment as claimed in claim 17, wherein said insulating annular plate is exchangeable with other insulating annular plates having different thicknesses.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX.

None